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ABSTRACT

A review of the journal literature on three instructional strategies (lecture, the small group, and the discussion method) reveals that research concerning teacher training in these strategies is extremely limited. (Journals were chosen as offering the most accessible research in this area). Although there is much anecdotal information on how to lecture, how tc utilize small groups, and how to lead class discussions, there is very little information on what kinds of training teacher educators need to give teachers in these instructional strategies or what kind of training in these strategies is most effective. Researchers in the future, therefore, should give greater attention to individual difference variables to determine what students learn most effectively via each instructional method. In addition, dependent variables will require comparable definitions and operationalization across studies. Researchers will also need to develop more sophisticated experimental designs and statistical techniques and recognize the need for situation specificity. Finally, several more variables should be examined, including teacher and student variables, teaching/learning process variables, and product variables. By following these suggestions, researchers will gain a better understanding of which teaching methods are most useful with various students under varying conditions. (A reference list and a list of journals reviewed are appended). (HOD)

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What Do We Know about Research in Teacher Training in Instructional Strategies?

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Introduction

Recent educational reports suggest that teacher training programs are not as effective as they should be. The 1983 report of the National Commission on Excellence in Education, for example, indicates that too many teachers are being drawn from the bottom quarter of graduating high school and college students the Commission also indicates that the teaching/learning process in our schools suffers as a result of such low academic students entering the teaching profession. Other facts reported in The American Teacher (1983) suggest other problems for our educational system:

> Less than 5 percent of the high school seniors who took the SAT in 1982 said they intended to major in education-down 50 percent since 1973. And, also in 1982, out of 36 possible fields of study open to college-bound high school seniors, prospective majors in education ranked 33rd in their SAT scores.
>
> We will need 197,000 more teachers each year from 1985 through 1900, to meet the new baby boom following the Vietnam War. But only 160,000 who graduate in teaching are expected to enter the profession. Clearly, a crisis is brewing.

Finally, two other factors may contribute to the problem in our schools. Recent research suggests that teachers-in-training devalue their pedogogy courses, are confident about their ability to teach, and view the enhancement of students' self-concept as more important than maximizing student achievement (Book et al., 1983). A second problem is that often the best teachers leave the teaching profession. The stresses of teaching for which teacher are often unprepared, lead to teacher burn-out and the pursuit of a different profession (Swick, and Hanley, 1980, Turner, 1983).

This paper answers the question, "What do we know about research in teacher instructional strategies? To answer this question we will examine the three most often used instructional strategies -- the lecture, the small group, and the discussion method. We will also discuss the areas of research we think are needed to improve Teacher Training in instructional strategies.

In our examination of the three instructional strategies we were primarily concerned with what research has been done examining the training in these strategies (A list of the journals we reviewed is included in the appendix to this paper). We reviewed these journals from the years 1981 - 1984. Cooper and Powell (1980) reviewed speech communication journals -- national and regional -- from 1975 - 1980. We utilized that review along with research reviewed by Cooper of educational journals from 1975 - 1982.

We chose to examine journals rather than convention papers or papers published by education department or teacher training centers. We believe the most accessible research on training in instructional strategies exists in these journals. Thus, teachers and teacher trainers would look first to these journals for training research.

Instructional Strategies

Lecture - Lecturing represents the most commonly used method of classroom instruction. Although it is frequently used the lecture method had been attacked for years. In the 1960's many viable and valuable alternatives to the lecture method were developed and implemented. The alternatives continue to be utilized, but the lecture continues to thrive in the 1980's and many of the controversies surrounding it also continue.

The research on lecturing falls into two main categories - lecture effectiveness and lecture as compared to other instructional strategies. Almost no research examines methods of training lecturers.

A large area of lecture effectiveness research examines notetaking. Much of this research is concerned with what is effective notetaking and what can the lecturer do to increase the effectiveness of student note-taking (Bentley, 1981). Day (1980) argued that different forms of lecture notes present different cognitive difficulties for students. She presented several lecture note formats (verbatim, outline, major points format, tree diagram, pictorial format, graphic format, and hybrid format), the strengths and weaknesses of each, and "hints" on when each would be most appropriate.

Other writers have focused more on the student's notetaking rather than on the lecturer's note writing. Collingwood and Hughes (1978) performed an experiment to determine the effectiveness of three kinds of lecture notes taken by sutdents -- duplicates of the lecturer's detailed notes, outlines of the lecturer's notes, and student's own notes. Students achieved better when given some form of lecture notes rather than relying on their own notes.

Carrier and Titus (1981) found that students pretrained in notetaking achieved higher on tests than did their untrained counterparts. These authors suggest that since students record only a small percentage of the total amount of information the lecturer presents (30% in this study), teachers should emphazie important dates, concepts, and principles through various elaborative strategies.

Students usually record in their notes what teachers write on the board (Locke, 1977). Thus, teachers should be descriminating in what they choose to put on the board or overhead transparancies.

Much of the lecture effectiveness research concerns the quality of a good lecture. Tennyson and Park (1980) suggest that an appropriate number of examples and a logical order to these examples is extremely important. Woods (1983) echos this idea when he argues that a clear purpose and clear organization make a lecture effective. Some researchers have tied the qualities of an effective lecture to how students process the information provided in a lective. McKeachie (1980) suggests that when the lecturer uses a simple organizational plan and many examples as well as an initial review in the lecturer's introduction, students will more easily process the information from the lecture (see also, McMann, 1979).

When Weaver (1982) asked students, teaching assistants, and faculty to rate the most important qualities of a large-group lecturer, the priorities of all three groups were similar:

1. Knowledge of subject matter and ability to explain it
2. Organization
3. Ability to capture and hold attention

4. Interesting lecture material
5. Competency
6. Enthusiasm

A sense of humor was ranked thirteenth by faculty, ninth by teaching assistants, and seventh by students. When lecturers were asked to rate the most valuable qualities of a lecture, they rated clarity, interest, logical organization and selection of appropriate content as most valuable (Brown and Daines, 1981). Thus, both those who lecture and those who listen to lectures agree fairly consistently on what qualities relate to lecture effectiveness.

The expressiveness of the lecturer relates to lecture effectiveness. Several studies have explosed the "Dr. Fox effect." Bases on a hypothesis by Erving Goffman, the Dr. Fox effect states that expressive behavior (variables of enthusiasm, humor, friendliness, vocal inflection, physical movement, and charisma) may influence an audience as much or more than content when there is little time or reason for the audience to evaluate the presentation (Goffman, 1959). Lecturer expressiveness seems to have an impact on student's receptivity and achievement on tests (Williams, and Ware, 1977). It also has a positive effect on student ratings of lecturer effectiveness (Williams, and Ware, 1977; Meier and Teldhusen 1979).

The impact of lecturer nonverbal expressiveness on improving mediated instruction was examined by Andersen and Withrow (1981). Lecturer nonverbal expressiveness predicted 22% of the variance in student effective learning but did not predict student cognitive learning. The authors conclude that nonverbal expressiveness is a potentially positive factor in improving instructional effectiveness.

Weaver (1981) suggests that to be expressive (inspirational) a lecturer should follow the AIDA formula (attention, interest, desire and action).

Some studies have compared the lecture method to other instructional strategies. For example, Friedley and his colleagues (1983) found that secondary school students liked the inquiry method of learning legal concepts better than the lecture method of learning legal concepts. Students reported that they found the content more challenging in the inquiry method (Friedley, et al., 1983). However, not all researchers have found similar results. Anderson and Butts (1980) found that students reacted to the subject matter being taught more than to the method by which it was being taught.

In terms of teacher training, none of these studies help teacher trainers very much. We know how lecturers and teachers characterize effective lecturers and we know that some students like other instructional methods better than the lecture. However, how does this information help us to train teachers? How do we teach organization? How do we teach the ability to capture and hold attention? To tell prospective teachers that they should be expressive, should use a simple organizational plan and many examples may not be very helpful to them. Without research which compares training strategies we can not know what's the best way to train teachers in lecturing.

Small Group

There is little research which relates to small group teaching. What is available is primarily in four areas: teaching as a problem solving activity, teaching problem solving to students, comparing small group to

whole group instruction, and methods of improving small group teaching.

The emphasis of the articles dealing with teaching as a problem-solving activity is two-fold - outline all the problems a teacher faces and then outline how to train teachers to solve problems. For example, Norman (1980) outlines problems such as structuring units and lessons, selection of student reinforcers, dealing with the unexpected, and classroom management decisions. Norman then offers five suggests for helping teachers-in-training learn problem solving skills. These range from "provides sufficient exposure of preservice students to classroom teaching experiences in public schools" to "plan sutdnet teaching experiences so that preservice student will have opportunities to become prefessional problem solvers and decision makers."

More help is available for teaching problem solving to students. Larkin, et al., (1980) suggest that understanding how students at various grade levels solve problems should be the basis for teachers teaching problem solving. The illustrate some of the ways this approach can be applied to make problems-solving instruction more effective. Similarly, Stonewater (1980) reviews four approaches to the teaching of problem solving (guided design, ADAPT, Rubenstein's "Patterns of Problem-Solving and remedial programs pulls from each approach elements for successful instruction in problem solving.

DeWald-Link and Wallace (1983) outline the types of problems students should be encouraged to pursue (controversial issues, management issues, nutritional issues, and parenthood issues), suggest a problem solving sequence to teach (an adaptation of Dewery's) and emphasize the teacher's role as facilitator.

Once again, the problem with the research available is that it does not focus on teacher training. For example, how do we train students to be facilitiators? What's the best method of training? No doubt we have all felt as Lodge (1976):

> ...one feels, as a teacher, rather like a soccer referee who, having blown his whistle for the kick-off, finds the players disconcertingly reluctant to make a move and is reduced to dribbling the ball himself furiously from end to end scoring brilliant goals in undefended nets, while the motionless players look curiously on.

Nothing in the research we reviewed would help a teacher education train her/his students to avoid or to handle the situation Lodge describes.

Discussion

In terms of research on the discussion method, the most often examined variable is questioning techniques. In the area questioning techniques the teacher educator is faced with a wealth of descriptive, prescriptive information plus a wide range of research dealing with effects of various questioning strategies. In his introduction to selected ERIC materials on questioning Work (1979) summarizes recent efforts in the area concluding:

> ...Questions such as the following have been raised: In a given learning environment, who talks, who listens, when, and to what effect? What proportion of classroom Time is devoted to lecture, discussion, viewing, reading, writing? What are the effects on student communication behaviors? Will sequence A in the use of questions in the classroom secure certain learning objectives more efficently than sequence B?(p. 80)

In his more recent ERIC report on questioning techniques Lange (1982) summarizes a wide range of articles related to: 1) research findings and 2) questioning and schema theory. He concludes with a prescriptive list of

suggestions gleaned from the literature and descriptions of instructional units and learning packages aimed to improve teacher questioning. There is no mention of research in effective ways of training teachers to handle questioning.

Over the past few years many articles have appeared on questioning in general raised many practical issues for elementary and secondary teachers. Other writers, (e.g. Cacha, 1981; Hyman, 1980, Hollingsworth, 1982) have also attempted to provide guidelines for classroom practice. Other studies examined the effect of questioning style on student behavior at the elementary and/or secondary level. One of the few studies designed to content oriented involved language arts teachers in a wait-time training program. (Fagan et. al., 1981). Yet the focus was on the effect on student reponses rather than on comparison among teacher training methods. The authors conclude: "Overall, it appears that training in higher level questioning techniques has more value to language arts teachers than training in wait-time." (272).

One of the interesting things we did find was the focus on teacher training in questioning/inquiry within the science education field. In 1978 a science education study(Chiappetta and Shares, 1978) attempted to determine the skills necessary for science teachers in order to: 1) identify a set of competencies for science teachers and 2) provide sufficient direction for experimental research in science teacher training. Using a Delphi technique selected members of the National Association for Research in Science Teaching ranked 5th the skills of "demonstrates ability to communicate" and 7th "teachers science using inquiry, process and discovery approaches." The research of the past few years bears witness to

the interest of science educators in studying teaching strategies.

A brief survey of selected studies indicates that other fields such as communication education, might benefit from their approaches and/or findings. In their study of psychological modeling as a method for acquiring science teaching skills Santiesteban and Koran (1977) attempted to: 1) compare the effects of video and audio models vs. no model treatment on the acquisition of certain teaching skills and 2) validate the skills in terms of elementary student learning. Among other things raters analyzed tapes for the frequency of observation questions and frequencies and categories of classification questions. The researchers concluded that "...both video and audio models are effective in producing the types of behaviors in preservice teachers displayed by the model... Both model treatments were more effective than the no-model treatment in the frequency of observation and classification questions asked."
In her study of increasing wait-time Deture (1979) reports one of the difficulties that has impeded wait-time research and teacher training is not having an efficient method to train teachers to use wait-time effectively. Using microteaching settings combined with audio and/video modeling DeTure concludes "It appears that modeling, particularly with the video model, is an inexpensive and expedient method for training teachers to learn to extend wait-time" (p. 561).

In a further study of wait-time feedback and questioning instruction Swift and Gooding (1983), used a combination of general instruction in questioning skills and electronic feedback devices that measure the duration of teacher and student pauses. They concluded that instructional materials alone produced little change in teaching behavior but that "Feedback procedures, modifying the wait time behavior of both students

and teachers, do produce a consistent pattern of increasing cognitive levels and interaction in middle school classrooms." (729) As a result of their attempt to examine the immediate and delayed effects of training pre-service science teachers to ask questions of varying cognitive levels. Crawley and Krockoner (1979) found their teaching module was effective in raising the average question level but the skills were not well retained over time.

A 1983 study by Otto and Schuck examined the effect of a teacher questioning strategy program on teaching behavior, student achievement and retention, and concluded that teachers can be trained to use the systematic questioning technique and employ it in the classroom. Students taught by these teachers will achieve significantly higher than those taught by control group members, and these achieving students will retain their knowledge for a period of time to a significantly greater degree than those taught by the control group.

It appears that speech-communication professionals can learn from the science enducators. There is a fertile field for followup work and for new ideas.

In addition to questioning techniques, teacher moves (saliciting, reacting, responding and structuring) have also been examined. For example, Blaney (1983) researched the effects of teacher structuring and reacting on student achievement. He found that reacting moves accounted for almost all the variance in achievement among students and structuring moves did not contribute significantly to achievement.

Clark and his associates conducted an interesting empirical study of structuring, soliciting, and reacting moves. They were concerned with how these moves related to student achievement. The most effective strategy for enhancing achievement was high structuring, low soliciting, and high reacting.

High structuring was characterized by a teacher's reviewing main ideas and facts covered, stating objectives at the beginning of the lesson, outlining lesson content, signaling transitions between parts of a lesson, indicating important parts in a lesson proceeded. Low soliciting was characterized by asking approximately 15% higher order questions and 85% lower order questions and teachers waiting in silence a relatively short time (less than three seconds) after asking a question, a student response, or before calling on another student. High reacting was characterized by praising correct responses, saying no when a student response was judged to be incorrect and providing a reason for the inconrrectness, prompting by providing a hint when a student response was incorrect or imcomplete, writing correct student responses on the chalkboard redirecting the question to a second student after the prompting had failed to elicit the answer from the first student, given the correct answer after prompting and redirecting has failed to elicit the correct answer from the student.

Much of the available material which falls under the "how to" category is anecdotal, not research based. Articles an how to start a discussion (Frederic, 1981) and content specific articles (Journet and Journet, 1979; Dahlek and Morash, 1982) are family common. However, these articles suggest such techniques as creating a mood. HOw do we train teachers to create a mood? What techniques of training in this area are most effective? Once again, personal anecdotes have their place, but without research based information, the teacher educator has little help in determing what training techniques are most effective.

Results

We can summarize teacher training research in instructional strategies as extremely limited. We have much anecdotal information on how to lecture, how to utilize small groups, and how to lead class discussions. However, we do not know what kinds of training teacher educators need to give teachers in these instructional strategies or what kind of training is most effective to give teachers in these strategies.

Articles describing teacher training for graduate assistants are helpful (Fredick and Powell, 1979, Russo, 1982 Stanton-Spicer and Nyquist, 1979). However, to be of real use in developing teacher training programs, research needs to be contricted comparing various teacher training programs and strategies.

Future Research Directions

> One rattlesome problem affecting research in teacher education has been the lack of articulation between conceptual positions and empirical validation of those positions. The distance between verbal descriptions so common in teacher education, and empirically verified priniciple is vast.
>
> (Denton and Mabry, 1981)

As this review indicates, we have many verbal descriptions, and conceptual positions concerning teacher training in instructional communication strategies. What we lack are empirical validations of those descriptions and positions. Which lecture techniques or small group techniques or discussion techniques would be best suited to a specific situation, specific goal, specific teacher or student? What effects in terms of student achievement, motivation, and satisfaction do various training techniques have? What are the best teacher training techniques for each of the teaching strategies? These

are just a few of the questions that remain unanswered.

Several reasons are apparent for the lack of answers. First of all, what is excellence in teaching? How do we know an effective teacher when we see one? Do we measure effective teaching by the product (student achievement, for example) or the process (classroom behaviors or both?) Denton and Mabry (1991) list several additional reasons: problems in the language used in the theories for teacher education, differences in operational definitions used to define the variables to be measures, the statistical tools used in empirical verification, and the difficulty of using an experimental design well-suited to the laboratory but ill-suited for the classroom.

In terms of future research, we suggest the following recommendations:

1) Individual difference variables need greater attention. What students learn most effectively via each instructional method? What teachers teach most effectively via each instructional method?

2) Dependent variables require comparable definitions and operationalization across studies. For example, what exactly is the inquiry method? This term is used to define several different teaching strategies.

3) There is a need for more sophisticated experimental designs and statistical techniques. Schofield and Stert (1979/80) describe how several researchers have too often used correlational techniques when more sophisticated statistical techniques such as regression would have yielded more information. We have argued elsewhere (Galvin and Cooper, 1980;1981) that multivariate research designs which combine teacher, student, process and/or product variables are needed.

4) Recognition should be given to the need for situation specificity in teacher training research. Teacher competence is relative to the social group in which the teacher operates and the grade level or subject matter taught. The effect of a teacher's strategy may change according to these conditions as well as to variations in pupil characteristics.

5) Several variables need to be examined: teacher variables (demographic, personality), student variables (demographic, personality), teaching/learning process variables (teacher classroom behavior, student classroom behavior, student-teacher interaction), and product variables (achievement, improved self-concept, improved student-teacher relationships, improved attitudes toward learning and the subject matter taught).

If we follow these suggestions, several important result should be accomplished. We should know more about what teaching competencies teachers need in order to produce student change and growth. We should have a better understanding of what teaching methods are most useful with various students and under varing conditions. Information such as this should in turn, lead us to a better idea of how to evaluate teaching. Ultimately, this imformation should enable us to develop effective teacher training programs.

Conclusion

This paper has review research in teacher training in instructional strategies. Three strategies were examined: lecture, small group, and discussion. Based on this literature review, several suggestions for future research were outlined.

APPENDIX

Journal Reviewed

American Educational Research Journal

American Journal of Education

Clearing House

Educational Horizons

Educational Leadership

Educational Psychologist

Educational Researcher

Educational Research Quarterly

Educational Studies

Educational Technology

Elementary School Journal

Focus on Learning

Higher Education

Improving College and University Teaching

Journal of Education

Journal of Educational Psychology

Journal of Teacher Education

Journal of Teaching and Learning

Journal of Verbal Learning and Verbal Behavior

Language Arts

Oxford Review of Education

Phi Delta Kappan

Research in Higher Education

Research in Teaching English

The Review of Education

Review of Educational Research

Review of Research in Science Teaching

The Social Studies

Texas Study of Secondary Education Research Journal

Texas Tech Journal of Education

Theory Into Practice

Universities Quarterly

New Directions in Teaching and Learning

National and Regional Communication Journals:

- Communication Education
- Communication Monographs
- Human Communication Research
- Journal of Communication
- Quarterly Journal of Speech
- Central States Speech Journal
- Communication Quarterly
- Southern Speech Communication Journal
- Western Journal of Speech Communication

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